

-22-

## Abstract of the Disclosure

An encoder to be located at the head end of a television program material distribution center. The encoder maps relatively large Ethernet addresses to smaller MPEG-2 address spaces by converting the Internet address to a number uniquely associated with program material. MPEG-2 frames created in this manner are placed in radio frequency slots within the frequency space occupied by a single analog television program. All types of Ethernet data, including Internet data, video program material from sources such as Microsoft NetShow Theater, digital audio and the like can all be converted to MPEG-2 bitstreams. This overcomes and reduces communications incompatibilities and complexities among set top boxes and existing head end because all digital set top boxes are designed to handle MPEG-2 data frames. The encoder provides the ability and necessary ingredient to provide dynamic linkage between Internet IP addresses and MPEG2 PID addresses permitting simultaneous connected operations between the Internet and Interactive TV programming accommodating interactive mediums spread across both environments. Several encoders may have radio frequency outputs stacked by a combiner and transmitted as a single wideband signal to build larger systems. The encoder can dynamically produce multiple content streams from a single stream from video servers or satellites, either time displaced or not, thereby reducing the costly bandwidth production requirements of video servers and satellites. This allows multiple threads of video program material to be transmitted simultaneously or multiple copies of the same thread to be transmitted with time delays between threads for either video-on-demand (VOD) or near-video-on-demand (NVOD) applications. The encoder dynamically balances bandwidth requirements between Internet, digital television and telephony applications by measuring actual bandwidth utilization and reallocating digital bandwidth

-23-

and spectrum allocation automatically. This is implemented by the automatic spectrum allocation function and the digital multiplexing functions under firmware and software control and is facilitated by a closed loop feedback control algorithm.

5